

**DRAINAGE REPORT**

**PREPARED FOR**

**EXISTING AND PROPOSED SITE CONDITIONS**

LOCATED AT:

26 PARSONS WALK

FCE #1709



DARIEN, CONNECTICUT

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**NARRATIVE:**

The subject of this report is a 1.399 acre parcel located at 26 Parsons Walk in Darien. The purpose of this report is to determine the existing and proposed runoffs resulting from the proposed site improvements in order to design a stormwater management system.

#### EXISTING CONDITIONS:

The subject parcel is located on the south side of Parsons Walk, at the terminus of the cul-de-sac. The lot currently contains a single family residence, and associated driveway, pool, patio and pool house. The lot slopes gently down across the width of the property, generally from the west to the east.

Existing soils at this location, as identified in the NRCS Soil Survey of Fairfield County, Connecticut, consist of a combination of Woodbridge fine sandy loam, 0 to 3 percent slopes, which has a Hydrologic classification of "C/D", and Canton and Charlton fine sandy loams, 3 to 8 percent slopes, which has a Hydrologic classification of "B".

For the purposes of this analysis a Hydrologic classification of "B" was used.

For the purposes of this analysis, the lot was considered to be vacant as an existing condition.

The existing runoff from a 50-Year rainfall event is 6.51 c.f.s.

#### PROPOSED CONDITIONS:

The proposal for this site is to raze the existing residence and construct a new single family residence with associated driveway. The existing pool, pool patio and pool house will remain.

The proposed runoff from a 50-Year rainfall event is 7.43 c.f.s.

## COMPUTATIONS:

The following computations of the existing and proposed conditions runoff flows were derived from the HydroCAD computer software. HydroCAD follows the NRCS TR-20 procedure for computing stormwater runoff. Computations were performed for a 50-year storm event, which has a 2% chance of occurring in any given 12 month period.

### Existing Conditions:

Lawn	60,923 s.f.	CN 69
Total	60,923 s.f.	

Weighted CN - **69**

### Proposed Conditions:

House	3,544 s.f.	CN 98
Driveway	2,350 s.f.	CN 98
Patios	2,541 s.f.	CN 98
Pool	652 s.f.	CN 98
Pool House	345 s.f.	CN 98
Walks	570 s.f.	CN 98
Lawn	50,921 s.f.	CN 69
Total -	60,923 s.f.	

Weighted CN - **74**

### Groundwater Recharge Volume (GWV):

Impervious area = 16.4 %

WQV =  $(0.1976 * 1.399 \text{ ac}) / 12 = 0.0230368 \text{ ac-ft} = 1,003.5 \text{ ft}^3$

GWQ =  $1,003.5 * 0.25 = 250.9 \text{ ft}^3$

## SUMMARY:

	100 Year	50 Year	25Yr.	10Yr.	5Yr.	2Yr.
Existing Runoff :	7.79 c.f.s.	<b>6.51</b> c.f.s.	5.27	3.72	2.66	1.50
Proposed Runoff :	8.74 c.f.s.	7.43 c.f.s.	6.14	4.49	3.35	2.06
Runoff Retained:	1.62 c.f.s.	1.45 c.f.s.	1.27	1.04	0.88	0.68
Areas Bypassing Retention						
Plus overflow:	7.93 c.f.s.	<b>6.48</b> c.f.s.	4.74	3.34	2.41	1.39

## CONCLUSIONS:

The increased run-off resulting from the proposed site improvements will be retained in an on-site retention system. The run-off from the driveway and the front half of the house roof will be routed to 21 units of Cultec C-100 retention chambers. The run-off from the patios and the rear half of the house roof will be routed to a separate set of 21 units of Cultec C-100 retention chambers. The pool patio and lower portion will be routed to retention via pump. The increase in stormwater runoff is mitigated on-site.

This system will decrease the net peak run-off during a 50 Year (2%) rainfall event to 6.48 c.f.s. from its current peak of 6.51 c.f.s.

The bottom of the Cultecs will be at elevation 100.5. A restrictive layer (groundwater and mottling) was found at an elevation of 99.2.

The proposed retention system provides a total of 1,162 ft<sup>3</sup> of storage, which will be adequate to maintain the net runoff during a 50 Year rainfall event, meets the Water Quality Volume, and will provide groundwater recharge.

The maximum peak net runoff from the proposed conditions decrease compared to the peak runoff from the existing conditions for each of the rainfall events from the 2 Year to the 50 Year rainfall events, as the table above illustrates.

The proposed improvements will have no adverse impact on surrounding properties.